# MISSOURI BOTANICAL GARDEN BULLETIN

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# Missouri Botanical Garden Bulletin

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## BOTANICAL GARDENS IN ANCIENT MEXICO*

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"THE first step in the process of making science", says Singer, in his *History of Biology* "is the systematic collection of facts. In biology, this is especially aided by botanical and zoological gardens. The habit of forming them is of great antiquity. We hear of them from Pliny." Others go back even farther and give the right of priority to Aristotle, as the founder of a botanical garden in about 350 B.C. But it is the year 1543 which is generally accepted as marking the establishment of the first modern botanical garden. The place was Pisa, Italy, and the credit goes to Grand Duke Cosmo de Medici I. Also, in the 16th century, according to Singer, early attempts were made to acclimatize exotic plants.

It is, therefore, of considerable interest to learn that, before Columbus discovered America, there already existed in Mexico gardens that might, in many respects, be considered botanical gardens. For example, the famous gardens of Netzahualcóyotl, king of Texcoco (of whom more later), were already in existence by the middle of the 15th century. And, according to Fernando de Alva Ixtlixochitl, a direct descendant of the Texcocan rulers, several of the gardens had belonged to Netzahualcóyotl's father and grandfather before him. Clavigero, in his *Storia Antica del Messico,* goes back to the era before the Aztecs, to show that their predecessors, the Chichimecas, had gardens before the Aztecs arrived, and that for a long time they used no human sacrifices, but offered in their temples only herbs, flowers, fruits and copal for incense. Paso y Troncoso traces gardens back even farther, to the Toltecs, and cites tradition in Michoacán to the effect that the monarchs of Tzintzuntzán, the empire of another group of Indians, the Tarascans, maintained gardens in the hills near Pátzcuaro where they, too, grew all the medicinal plants known to their people.

As in the European gardens, medicinal plants were a conspicuous element in the early Mexican gardens. Although, according to the noted Mexican naturalist, Dr. Manuel Mald-

*Prepared, on invitation, for the International Botanical Congress held in Paris, France, July 2-14, 1954.

From Solis y Rivadeynera, *Historia de la Conquista de México,* pp. 460–461. (1684). Typical of illustrations based more on fancy than on fact. The letters are supposed to represent the following:

A. Texcoco — northeast of Mexico City
B. The principal avenue into the city
D. Ixtapalapa—southeast of Mexico City
E. Mexico City
F. Aqueduct
G. Coyoacan, south of Mexico city
K. Xochimilco
L. Other avenues

Any attempt to correlate the places listed in the illustrations with their localities can only result in complete frustration.

onado Koerdell, the Mexicans may not have equalled their European contemporaries in general knowledge, they were far advanced in their understanding of the curative properties of various plants. Dr. Emma Walcott Emmart, editor of the 1940 edition of the so-called *Badianus Manuscript*, concurs in that view. "Few countries in the world", she says, "can boast of such an extensive knowledge of native herb remedies as existed among the Nahuatl speaking people." In the development of this knowledge it would seem quite likely that the royal gardens of the Mexicans played a very important role.

## EARLIEST REPORTS

On what do we base our knowledge of these gardens? The earliest reports come from the letters that Hernán Córtes himself sent to the King of Spain. These "Cartas de Relación", as they are called, cover the period from July 10, 1519, to September 3, 1526, and have been translated into many languages and printed in many editions. There were five letters altogether, and in the second of these, where Cortes described his march from Veracruz to Mexico City, we find our first reference to a Mexican garden.

This was a garden located at Ixtapalapa on the outskirts of Mexico City, in the palace of Cuitlahuatzin, brother of Moctezuma, the Aztec emperor. Here, in the last of the gardens to be built, Cortes spent the night just before his triumphal entry into the capital city of the Aztecs, and he describes what he saw as follows: "There are . . . very refreshing gardens with many trees and sweet scented flowers . . . He (Cuitlahuatzin), has also a large orchard near the house, overlooking a high terrace, with many beautiful corridors and rooms . . . toward the wall of the garden are hedges of lattice work made of cane, behind which are all sorts of plantations of trees and aromatic herbs."

From the botanical point of view, this description certainly leaves much to be desired and many have wished, with Prescott, that some one like Fernández de Oviedo had accompanied Cortes on his Mexican adventure, for then we might have had more meaningful descriptions of the plants found in these early Mexican gardens.

The gardens at Ixtapalapa made a strong impression, too, on another of the conquistadores, Bernal Díaz del Castillo, who waited almost fifty years to write his *True History of the Conquest of Mexico.* Although there are some who criticise his writings as crude and boastful, most readers view the efforts of this soldier-author, relying on his memories, as an extraordinarily fresh and vivid account of the events of those bygone days. Of the gardens at Ixtapalapa he says, "The garden and orchard are most admirable. I saw and walked about in them and could not satiate myself sufficiently looking at the many kinds of trees and enjoying the perfumes of each. There were walks bordered with the roses of this country, and flowers and many fruit trees and flowering shrubs . . ."

## MOCTEZUMA'S GARDENS

If such glowing terms as these could be used to describe the gardens of Moctezuma's brother, imagine how splendid must have been the gardens of Moctezuma himself! For a general description of the Mexican royal gardens we turn first to the Franciscan monk, Toribio de Benavente, or Motolinia, as he preferred to be known. He was one of the group of missionaries who came to Mexico shortly after the Conquest, and in 1541 he wrote his *Historia de los Indios de la Nueva España.* In it we find the following: "The greater part of the city was surrounded by fresh water and contained many cool groves of cedars, cypresses, willows and flowering trees. The Indian lords do not try to raise fruit trees because fruit is brought to them by their vassals, but rather forest trees from which they can pluck flowers." Farther on, the King is quoted as having said, "The raising of plants for food is not the concern of rulers but that of slaves or merchants." This idea is repeated by Antonio Solis in his *Historia de la Conquista de Mexico.* In describing the gardens of Moctezuma in Tenochtitlán (Mexico City), he says: "In all their houses they had large gardens carefully cultivated. All around were flowers of rare diversity and fragrance, and medicinal herbs which were used in flower beds and

Part of remaining row of ahahuetes at the "Bosque del Contador", planted by Nezahualcoyotl about 1450. From Nuttall, *The Gardens of Ancient Mexico* (Ann. Rept. Smithson. Inst. 1923, pl. 1. 1925).

bowers. These were given much care, and arrangements were made to have brought to the garden all the kinds of plants that this benign land produces. Here the physicians learned the names of the plants and an understanding of their virtues. They had herbs for all ills and ailments, and from the juices . . . they prepared their remedies." Then Solis repeats the point made by Motolinia: "But they did not like fruit trees nor edible plants in their places of recreation. In days gone by they used to say that orchards belonged to ordinary people, and it seemed more appropriate among the princes that their pleasures should not be marred by ideas of utility."

Bernal Díaz in describing the palace of Moctezuma, does not forget the gardens:

"We must not forget the gardens of flowers and sweet scented trees, and the many kinds that there were of them, and the arrangement of them and the walks, and the ponds and tanks of fresh water where the water entered at one end and flowed out of the other; and the baths which he had there, and the variety of small birds that nested in the branches, and medicinal and useful herbs that were in the gardens. It was a wonder to see, and to take care of it there were many gardeners."

Francisco Cervántes de Salazar, another friend of Córtes and official chronicler of the city of Mexico, wrote his *Crónica de Nueva España* in 1560-1567. (This work, once thought lost was rediscovered by Zelia Nuttall in 1911, in Madrid.) In it we find specific references to Moctezuma's various gardens: one in the center of the capital city, Tenochtitlán; another to the west of the city, on the slopes of Grasshopper Hill, or Chapultepec (to use its Aztec name); a third, at a site called El Peñon, in the midst of the lake of Mexico, noted for its hot springs and thermal baths; and a

fourth, in Atlixco, used as a hunting preserve. An interesting map, attributed to Córtes, and first published in Nurnberg in 1524, in the Latin translation of Córtes' second and third letters by Pedro de Savorgnani, shows the house and gardens of Moctezuma outside the city, and the new palace within the city, also with an adjoining garden.

According to Cervantes, "This great monarch had many pleasances and spacious gardens with paths and channels for irrigation. These gardens contained only medicinal and aromatic herbs, flowers, native roses and trees with fragrant blossoms, of which there are many kinds." In another of his works, *México en 1554,* Cervantes says, "On the top of the hill Montezuma had cultivated trees as if it were a garden, and on its steep sides were terraces with other groves of trees and hanging gardens." He, too, reports that Moctezuma had ordered his physicians to experiment with the medicinal herbs and to employ those best known and tried, as remedies in healing the ills of the lords of his court.

Of special interest is Cervantes' description of the period when Córtes held Moctezuma prisoner. He tells how the Aztec emperor was occasionally given permission to visit one of his gardens for rest and solace. At such time he generally chose the beautiful gardens in near-by Chapultepec, many of whose magnificent ahuehuete trees (*Taxodium mucronatum*) are still in existence. One can imagine the captive Moctezuma walking disconsolately beneath these green giants, while his thoughts turned, perhaps, to those days when he was all-powerful and he had only to wish for something and his wish was granted. Perhaps he recalled the time when he heard of a king named Malinal, who lived south of Tenochtitlán, near Oaxaca, at a place called Tlaxiaco. Among the treasured possessions of this king, it was reported, there was a beautiful tree called in Nahuatl "tlapalixquixochitl", or "tree of many red flowers". (This is, according to Dr. Faustino Miranda, perhaps a variety of the tree known today as "huanita", *Bourreria huanita.*) Moctezuma sent a demand to Malinal for this tree but surprisingly Malinal refused the request. Upon which Moctezuma promptly sent an armed force to Oaxaca. His men vanquished the troops of Malinal and returned to Mexico with the tree, and presumably with many captives besides.

## THE GARDENS AT HUAXTEPEC

Moctezuma's finest gardens, which he had inherited from his predecessor, Moctezuma the Elder, were located at some distance from the capital, in Huaxtepec. The story of their founding is in Diego Durán's *Historia de los Indios de Nueva España* and in Hernando Alvarado Tezozomoc's *Crónica Mexicana.* Both tell how the elder Moctezuma, when reminded that, in the past, his ancestors had once inhabited that delightful area around Huaxtepec, decided to establish a garden there. First he sent to Cuetlaxtlán* along the coast for various plants.

* According to Henry Bruman, this locality is known today as Coatáxtla.

Among those which arrived were "yoloxóchitl" (*Talauma mexicana*, the Mexican magnolia), "cacaloxúchitl" (*Plumeria*, known as frangi-pani in many tropical areas today), and "huacaxóchitl" (one of the Araceae). All these three plants were reserved for the exclusive use of the rulers. Others were "cacahuaxochitl" (Quararibea), "tlilxóchitl" (vanilla), "ixquixóchitl" (the aforementioned Bourreria), "mecaxóchitl" (Piper), and many others. The plants were sent carefully prepared, the roots covered with soil and wrapped, and the Indian gardeners who accompanied the plants took such good care of them, and the land was so fertile and well watered that in less than three years all the plants had flowered and not one had been lost. All this caused much wonder among the gardeners for, it seemed, the plants grew better at Huaxtepec than they had in their native habitat.

Another description of Oaxtepec, as it is sometimes spelled, is found in a group of reports written toward the close of the 16th century. These reports are called "Relaciones" and contain answers to a series of questions, covering every aspect of the land and its resources, as well as the life of the people and their culture. As an example, the Relación for Oaxtepec (also written Guastepeque) which was prepared in 1580, states, among other things, that although the inhabitants did not pay tribute to "Motenzuma", they did accompany him on expeditions to Chiapas and Veracruz, and when they returned they brought with them various trees, among them cacao and "batey". The latter was the tree from which they extracted rubber (*Castilla elastica?*), says the report. And, it continues, "Motenzuma ordered them to be planted in this village, in a woods near by in a ravine, which spot was to serve later for his recreation."

Huaxtepec, too, came in for its share of extravagant praise from Díaz del Castillo. "It is the finest that I have seen in all my life", he says and quotes Captain Sandoval (who, on an expedition to the "tierra caliente", was the first to see Huaxtepec), as calling it the most beautiful garden he had seen in New Spain. He then cites Córtes as stating that "he had never seen a finer garden in Castille." Córtes corroborates this by writing in his third letter that the garden is the "best, most beautiful and refreshing that I have ever seen. A very pretty rivulet with high banks runs through it from one end to another. In it are an infinite number of trees with varied fruits, many herbs and fragrant flowers."

Still another report on Huaxtepec comes from Dr. Francisco Hernández, who was in Mexico on a mission from the King of Spain at about the time Díaz del Castillo was writing his memoirs. Commissioned by Philip II to prepare a report on New Spain which would cover the natural resources of the area and its political history, Hernández arrived in Mexico in 1570. He spent the next five years traveling over a very considerable part of México and, of course, visited all the important gardens then in existence. In Ixtapalapa, for example, he noted much of interest, particularly

From E. Stahl, *Mexicanische Nadelholzer* (in *Vegetationsbilder*, edited by G. Karsten and H. Schenck, 2 Reihe, Heft 3, tafel 15). *Taxodium mucronatum* Tenore, the "ahuehuete" of the Aztecs, in Chapultepec, Mexico. Spanish moss hangs from the branches.

a large "tlatzcan", or cypress tree. (This is identified by Dr. Miranda as probably *Cupressus Lindleyi.*)

Huaxtepec, of course, provided Hernández with much important information for his studies of Mexican plants. Unfortunately, his work was not printed until almost a hundred years later and then in a much modified version. A copy of this version, in manuscript, fell into the hands of a Dominican priest, Francisco Ximénez, who lived at Huaxtepec, in the Hospital de los Hipolitos, founded there shortly after the Conquest. Ximénez added to the manuscript from his own knowledge of the plants of the country and, in 1615, published his highly interesting "Quatro Libros de la Naturaleza." In it we find mention of many plants of medicinal value, among them "bálsamo de las Indias", or "hoitzilóxitl" (*Myroxylon balsamum* var. *Pereirae*) and Cheiranthodendron, the hand flower tree, "macpalxochiquahuitl". According to Cla-

vigero, in 1780, medicinal plants were still being cultivated in the gardens at Huaxtepec and were being used in the hospital.

Hernández was deeply impressed, too, by the part that flowers played in the court ritual. He says that among the Aztecs it was a sign of respect to bring flowers when calling on some one, particularly if that someone were the King. Torquemada illustrates this with the story of a group of Indian chieftains who arrived at Tenochtitlán one day, and asked for an audience with Moctezuma. This was granted for the next day, but at sunset it was discovered that there were no flowers available, worthy of presenting to the king. Immediately they hunted up a youth famed for his speed as a runner, and dispatched him to Cuernavaca about 50 miles away. This town, which in the 15th century paid a daily tribute of flowers to the King of Texcoco, is still one of Mexico's garden cities, famous for its year-round flowers. The runner reached Cuernavaca at midnight, picked up the flowers and the next morning was back in Mexico City with the desired offering.

Having mentioned Cuernavaca, it is interesting to note that reports of the gardens near Quauhnahuac (Cuernavaca) are included in the work of Díaz del Castillo. (Later accounts of a famous garden in Cuernavaca in the 16th century, which belonged to some one by the name of Díaz, suggest that perhaps in helping to "liberate" the Mexicans from Moctezuma, Díaz liberated these gardens for himself.)

Torquemada, too, described the gardens at Huaxtepec.

> "The garden measured two leagues in circumference. In the middle of it ran a river, its banks shaded by many groves of trees. Here and there were resting places with gardens of many different kinds of flowers and fruits. There were buildings, seed beds, fountains and, scattered among the rocky cliffs which were decorated with carvings, were arbors, chapels, look-outs and stairways cut into the very rock."

As mentioned earlier, the descriptions we have of the early Mexican gardens are often so superficial and inadequate that it is difficult to make up even a partial list of the plants that flourished in them. One such list, for Huaxtepec, was prepared in the 1920's by Zelia Nuttall, the American anthropologist. It included Persea or "aguacate", the avocado; Crataegus or "tejocote", the hawthorn; *Prunus capulin*, the Mexican cherry; various members of the Sapotaceae *Moctezuma speciosissima*, of the Bombacaceae; Ceiba or "pochote", the silk cotton tree; Poinsettia; Cleome; Acacia; Yucca; Tigridia or "oceloxóchitl"; Tagetes or "cempalxóchitl", the marigold; Zinnia; Hibiscus; Psidium or "xalxocotl", the guava; Spondias; as well as many species of ferns, palms, orchids and cacti. One is tempted to accept Mrs. Nuttall's list with some assurance since it contains plants that continue to be used in Mexico today as ornamentals and medicinal plants.

## THE GARDENS OF NETZAHUALCOYOTL

Almost as famous as the gardens of Moctezuma and his brother were those of the King of Texcoco, Netzahualcóyotl, and for the first reference to these, we return to Motolinia.

"Especially notable", he says, "was the house of the principal lord; both the old house with its garden surrounded by over a thousand large and beautiful cedars, most of which are still standing, although the house has been razed; and the other house, in which a whole army could be lodged, with many gardens and a very large pool which was entered in boats through an underground passage." Motolinia's work was used frequently by other writers on the history of Mexico, among them Francisco López de Gomara, chaplain to Córtes after his return to Spain, and his official historian, who wrote the *Historia General de las Indias* in 1552. Most of his information came, of course, from Córtes but the material on gardens seems to have been copied from Motolinia, and this, in turn, formed the basis of later references by the "cronista mayor de su magestad," Antonio Herrera y Tordesilla, who published his *Historia General de los Hechos de los Castellanos* in 1601.

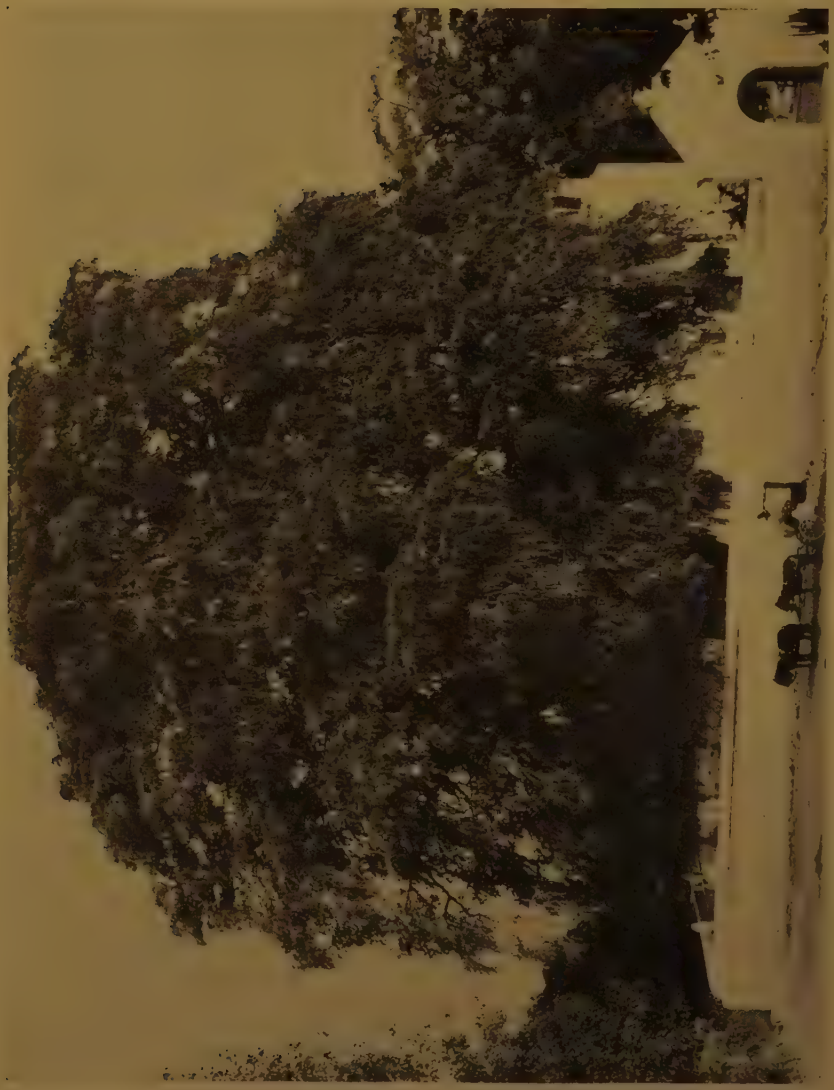
Two works by descendants of the Aztec rulers supply us with additional details of the gardens of Netzahualcóytol. One called *Relación de Texcoco* was written in 1583 by his grandson, Juan Bautista Pomar, and contains the following description of one of the gardens:

> "There is no principal and abundant source of water in this city . . . It was necessary to unite into one the many springs at their sources, . . . channeling them into canals. This was done by Netzahualcóyotl and Netzahualpitzintzli, not so much to provide drinking water . . . as to provide water to irrigate the orchards and gardens . . . Not only did they raise the flowers that grow naturally in this area, but they also had others from the more temperate regions and the tropics, all of which they cared for with much effort."

According to Dr. Maldonado, the exact location of this garden is not known, except that it was about 12 leagues (30 miles) from Texcoco.

The second work is the important *Historia Chichimeca* of Fernando de Alva Ixtlilxóchitl, written early in the 1600's. Here we read of the many wonders of the gardens: elaborate buildings, irrigation canals, reservoirs, baths, stairways, terraces; of how aqueducts brought water to fountains from which a spray fell like gentle rain over the plants in the garden; of how the job of caring for the extensive gardens was assigned to different tribes as their tribute to the sovereign, each charged with definite duties in certain parts of the gardens. Perhaps, as Susan Hale says, Ixtlilxóchitl "cast over his picture of the Golden Age of Texcoco a glow which is hardly justified by the cold light of modern research", and perhaps his story is now "regarded as unreliable in many particulars". On the other hand, other authors talk of Netzahualcóyotl, the poet king, as a wise, enlightened and cultured sovereign who, during his long reign (1403-1474), made of Texcoco the "Athens of America."

Ixtlilxóchitl lists eight gardens that belonged to Netzahualcóyotl and singles out one at Tzinanostic (also written Tzinacostoc and Tzinaconoztoc) as his grandfather's favorite. Mendizabal cites still another at Chichuhnoyacán, which was supposed to have been the favorite of Netzahualcóyotl's father. The most famous of the gardens in the kingdom of Texcoco was, however, without a doubt the one at Tetzcotzingo, on the slopes and sum-



Bald Cypress (Ahuehuete) at Santa Maria del Tule,

mit of a hill near a spot now known as the Molino de las Flores. According to Fray Agustín Dávila Padilla, as quoted by Mendizabal, "The entire hill was planted with beautiful groves of trees and lovely orchards, with many jasmin plants and other scented flowers." One may wonder, in passing, why the Royal Gardens in Mexico were so often placed on the summits and slopes of hills. Perhaps it was because they were connected in some way with religious ceremonies. The kings were also priests, it must not be forgotten, and hill tops made ideal sites for astronomical observations and for conducting impressive rituals.

## AFTER THE CONQUEST

What has happened to all these gardens in the years since the Conquest? We have the answer in the reports of travellers who continue to visit México and describe the things they saw. One of the earliest to visit México after the War of Independence was W. Bullock who, after a trip to Mexico, in 1823, wrote his *Six Months Residence and Travels in Mexico.* In this he described the aqueduct at Tetzcotzingo and the old cypresses in the old palace of Netzahualcóyotl, as well as many aspects of the plant life that attracted him in his travels.

In 1853, Brantz Mayer, of the U.S. diplomatic corps in México, wrote a scholarly detailed historical study of Mexico. In volume 2 of this work, he describes at great length the resources of México, and the things that interest visitors to that country. Among the latter, he cites particularly the ruins near the summit of Tetzcotzingo, 3 miles west of Texcoco, and the aqueduct that brought water to the gardens of Netzahualcóyotl. He describes also the Bosque del Contador, northwest of Texcoco as:

> "An ancient grove of double rows of gigantic cypresses, 500 in number, arranged in a square corresponding to the points of the compass and enclosing an area of nearly 10 acres. At the northwest point of this quadrangle, another double row of lordly cypresses runs westward toward a dyke north of which there is a deeply oblong tank, neatly walled and filled with water. From the soft spongy character of the soil in the center of the great quadrangular grove, it is supposed that the vast area was once occupied by a lake. Along the raised banks and beneath the shadow of the double line of majestic trees were the walks and arbors in which Netzahualcóyotl and his courtiers amused themselves."

In 1861, Edward Burnett Tylor in his *Anahuac*, described the gardens at Tetzcotzingo as follows: "The hill itself was overgrown with brushwood, aloes (agave, probably), prickly pear, but numerous roads and flights of steps cut in the rock were distinguishable." He, too, mentions going to the Bosque del Contador, near Texcoco, where there was a "grand square looking toward the cardinal points and composed of ahuehuetes, grand old deciduous cypresses, many of them 40 feet round and older than the discovery of America." One finds similar references in Susan Hale's *Mexico.* "A magnificent grove of lofty ahuehuetes at some distance from the central part of the grounds surrounds a large quadrangle now dry, which was probably an artificial lake in the time of the great king." At Texcoco "are left remains of terraced walls, and stairways wind around the hill from the bottom to the top. The country

all about is full of artificial embankments, reservoirs, and aqueducts for leading water and developing the attractions of the place." Miss Hale wrote also of her visit to Chapultepec: "There is now standing an ancient cypress or ahuehuete, huge among the other great trees of the grove, which goes by the name of Montezuma's cypress. Its gnarled trunk must measure more than 100 feet across and its branches themselves are as big as trees."

In October, 1941, Cora Oneal, writing in the *Bulletin of the Pan American Union,* gives her impressions of the gardens at Texcotzingo; "The gardens of this royal retreat were planted in terraces, and even now, after centuries of decay, some of the steps leading to them remain in good condition. Extremely well preserved nearby is a large bathing pool with a stone seat and small fountain, all carved from native porphyry." It is interesting to note Mrs. Oneal's use of the term "large". An earlier writer describing the same bath wrote: "It might have been his foot bath, if you will, but it would have been an impossibility for any monarch, of larger dimensions than Oberon, to take a duck in it."

As for Huaxtepec, we have the description written in 1930 by Enrique Juan Palacios, when he visited the area to study the archaeological remains found there. Of all the exciting list of plants brought there at the orders of Moctezuma, there remains not one. Only the imposing grove of ahuehuetes has survived. Approaching this "bosque", says Palacios, "the terrain becomes rough and broken, covered with vegetation. Heavy matted thickets alternate with clumps of trees, mangroves (?), willows and figs . . . innumerable springs, clear "ojos de agua" bubble continuously at the foot of the majestic cypresses. In spots they gush forth, it seems, from the very roots of the bananas and other trees that flourish on the site". He recalls the words cited by Durán, "I hear that it is fertile and plentiful land, with abundant water and springs. Especially famous are the springs in Hauxtepec where, for your relaxation and recreation and for your descendants, it would be delightful to have a large basin or reservoir where all this water could be gathered as high as it could rise, to irrigate all the land that it could reach". Palacios comments also on the enormous fig trees that he sees, and speculates that these could well have been the source of the paper which the inhabitants of nearby Tepoztlán prepared from the bark of these trees and sent as tribute to the Aztec capital.

How shall we evaluate these gardens today? How much reliance can we place on the various descriptions and reports of these gardens that have come down to us? To answer the last question first, perhaps we might select the following kinds of reports as the most dependable and trustworthy: first, the accounts of the conquistadores, themselves, Córtes, Díaz del Castillo; then the accounts of the monks who followed so closely on the heels of the soldiers; then the accounts written by the descendants of the Aztecs living in Mexico at the time of

the Conquest; and, finally, the descriptions of various parts of Mexico, called *Relaciones*, which were mentioned earlier in this article.

On the other hand, many references to the gardens of the ancient Mexicans are second-hand accounts; often based, it is true, on original reports, but so embroidered and decorated with imaginary details that they must be discounted when we try to evaluate the true value of the gardens which the Spaniards found in the land of the Aztecs. Such would be, for example, the *Historia de la Conquista de México*, by Antonio Solís y Rivadeynera. Solís was never in Mexico, had not had any dealings with the Indians, did not know the American scene. What he knew of Mexico he learned from reading. Yet his writing was of such a high literary quality that he had an enormous following and his work went through many editions. The same might be said of Prescott, who made masterly use of all kinds of documents, published and unpublished, to produce a work, that sets a high level of scholarship but reveals, in spots, the author's lack of direct contact with the country of which he was writing.

Finally, can we consider that these early Mexican gardens were truly botanic gardens; C. Stuart Gager, in Bailey's *Standard Cyclopedia of Horticulture*, defined a botanical garden as follows: "A collection of growing plants, both native and exotic, the primary purpose of which is the advancement and diffusion of botanical knowledge, as distinguished from agriculture and horticulture." Is this not faintly reminiscent of the tradition against raising purely food plants in the royal Mexican gardens? Gager points out, too, that although botanical gardens are used today in many ways — for the identification and classification of plants, for the investigation of plant morphology and physiology, for teaching, and for general plant research, they were developed originally out of an interest in plants that could be used medicinally. Modern botanical gardens, he recalls, were derived directly from the private gardens of the herbalists who were primarily interested in medicinal plants; and these gardens were, in their turn, outgrowths of the herb gardens in the monasteries of the Middle Ages.

Certainly the early Mexican gardens meet a number of the criteria set up in the Gager definition. They were collections of plants, both native and exotic. Their major purposes were the cultivation of medicinal and ornamental plants. Furthermore, it might be pointed out that a study of botanical knowledge among the Aztecs, like the one carried out by Paso y Troncoso, indicates that these early Mexicans had even evolved a kind of system of plant classification that is not too far removed from the taxonomy of their European contemporaries. It does not therefore seem at all far-fetched to consider that the places where these plants were being grown and studied could have been what we might call today botanical gardens, or, perhaps better, arboreta, since the emphasis was on woody plants. Today, we must hunt for the fragmentary remains of these once magnificent establishments. What a pity that no attempt was made to

preserve these gardens for posterity! As one views some of the results of the conquest of the Aztecs by the Spaniards — the destruction of the superb monuments and temples, the burning of the priceless picture-manuscripts, the neglect of the botanical gardens, one is forced to wonder where to draw the line between the civilized nation and the barbarian.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## A FEW LINES ABOUT AN ORCHID PLANT

Last year I was given a blooming orchid plant. After the blossoms had faded, I put it in my small greenhouse where I grow zonal geraniums, thinking that if it lived, all right, and if it died I would not worry. I have been trying to simplify my greenhouse operation by growing nothing but geraniums, so I placed the plant in a corner of one of the benches and left it to its fate. I did not even hang it up in the light and air as I had intended doing.

The orchid plant has been on the bench in the midst of blooming geraniums for a year. It has not been fertilized and has been watered as geraniums are watered, — every day, water being poured into the pots with practically no overhead sprinkling. As I do not do the watering myself, occasionally when working on my geraniums I remembered to sprinkle it lightly, but during summer heat for many days the plant had no water on its foliage. About two weeks ago it started to bloom. I brought it into the house and now it has four beautiful blossoms and a delicious fragrance which I notice every time I enter the room. It is a Brasso-Cattleya, and I am told its fragrance comes from its Brassavola parentage.

So I found that an orchid plant is tougher than I had thought it to be. It can flower and flourish even if not treated according to directions (which say, for instance, that an orchid should be watered only every other day). I shall give it better treatment next year, but of one thing I am certain—it will not flower better than it has done this winter with no care at all. ANNE L. LEHMANN

## BALKAN HOLLY (*Ilex aquifolium* var. *angustifolium*)

IN 1934, during a plant-hunting expedition to the Balkan countries of southeastern Europe, Edgar Anderson (then of the Arnold Arboretum) collected seeds and plants of several interesting evergreens, including the Bulgarian Ivy (*Hedera helix* "Bulgaria"), Balkan Yew (*Taxus baccata*), Butcher's Broom (*Ruscus aculeatus*), and the Balkan Holly (*Ilex aquifolium*). All these introductions were grown at the City Garden or the Arboretum at Gray Summit, and now, after twenty years of trial, are turning out to be among the best of their kind for this area. The number of broadleaf evergreens hardy in this part of the Midwest has always been very limited, but it is increasing, and the Balkan Holly is one which will take its place.

The ordinary English Christmas Holly (*Ilex aquifolium*), indigenous to western Europe, is not reliable in our area, even during normal winters. Plants sometimes do pull through a series of mild winters only to be killed outright or damaged severely in ordinary years. Efforts to find hardy forms of it have proved fruitless. But, fortunately, several climatic forms of *Ilex aquifolium* do exist in Europe, including the form native to the Balkan Peninsula.

The Balkan Holly occurs in the Balkan mountains in southeastern Europe where the climatic patterns closely simulate those in parts of our own Midwest. Plants grown from the original introduction of twenty years ago, although of slow growth, have survived the many rigors of winter and summer over this period. Temperatures of 10° below zero and a high of 115° above have not inhibited the growth of this holly in the Garden. From the original introduction, we have three plants, one a male, another a female, and a third plant of unknown sex which was repeatedly frozen back at the Arboretum during a couple of 20° below-zero winters before being brought into the City. This year our male and female plants flowered together for the first time, and the female plant, now about eight feet tall, has this autumn turned up with a few bright red berries, very reminiscent of those on ordinary English holly. The Balkan Holly looks like the English Christmas Holly with evergreen leaves and bright red berries, except that the leaves of the Balkan variety lack the lustre of its more comely English cousin.

Further testing will, we hope, completely substantiate our views regarding the virtuous qualities of this evergreen holly for our area.

The severe freeze of last March 26, did not faze the Balkan hollies in the Garden. Early or late freezes affecting tender growth plus warm-ups and bright sun in mid-winter generally do the most damage to broadleaf evergreens in the St. Louis area. Climatic patterns, especially the timing of warm and cold weather, are of greater importance in relation to hardiness than the absolute minimum or maximum temperature. F. G. MEYER

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## SOME FACTS ABOUT SHAW'S GARDEN

The Missouri Botanical Garden (the official name chosen by Mr. Shaw) carries on the garden established by Henry Shaw over a century ago at TOWER GROVE, his country home. It is a private institution and has no support from city or state. The old stone walls and cast-iron fences, the Linnaean House, the Museum, the Mausoleum, and the TOWER GROVE mansion all date from Mr. Shaw's time. Since his death, as directed in his will, the Garden has been in the hands of a Board of Trustees who appoint the Director.

The Garden is open every day in the year (except New Year's and Christmas) from nine A. M. until seven P. M. (April to November) and until six (November to April) though the greenhouses close at five. TOWER GROVE, itself, Mr. Shaw's old country home, is open from one until four. The Garden is nearly a mile long and has several entrances. The Main Entrance, the one used by the general public, is at Tower Grove and Flora Place on the Sarah bus line (No. 42). The Park Southampton buses (No. 80), direct from downtown, pass within three blocks of this entrance and stop directly across the street from the Administration Building at 2315 Tower Grove Avenue. The latter is the best entrance for students, visiting scientists, etc. It is open to such visitors after 8:30 a. m., but is closed on Saturdays, Sundays, and holidays. There is a service entrance on Alfred Avenue, one block south of Shaw Avenue.

Since Mr. Shaw's time an Arboretum has been developed at Gray Summit, Mo., adjacent to State Highways 50 and 66. It is open every day in the year and has two miles of auto roads as well as foot trails through the wild-flower reservation. There is a pinetum and an extensive display of daffodils and other narcissi from March to early May.